

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R036XB119NM

Site Name: Clayey Bottomland

Precipitation or Climate Zone: 10 - 16 inches

Phase: NA

XBYSIOGRAPHIC FEATURES

Narrative:

This site occurs in valley or floodplain positions, including swales or draws with substantial drainage areas. This site can receive periodic inundation from flood waters.

Land Form:

1. Bottomland
2. Floodplain
3. Valley floor

Aspect:

1. Not significant
- 2.
- 3.

	Minimum	Maximum
Elevation (feet)	6,000	7,300
Slope (percent)	0	4
Water Table Depth (inches)	54	>72
Flooding:	Minimum	Maximum
Frequency	Rare	Frequent
Duration	Very brief	long
Ponding:	Minimum	Maximum
Depth (inches)	None	None
Frequency	None	None
Duration	None	none

Runoff Class:

High

Hydrologic group D

CLIMATIC FEATURES

Narrative:

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from 5 to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. Half or more of the annual precipitation can be expected to come during the period of July through September. Fall conditions are often more favorable for growth of cool season perennial grasses, shrubs, and forbs than those of spring.

	Minimum	Maximum
Frost-free period (days):	51	171
Freeze-free period (days):	130	252
Mean annual precipitation (inches):	10	16

Monthly moisture (inches) and temperature (⁰F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.40	.91	12.9	47.0
February	.43	.65	16.6	51.2
March	.47	1.10	20.9	57.1
April	.30	.49	26.1	65.3
May	.46	.98	33.4	74.2
June	.51	.57	41.4	84.2
July	2.15	3.45	50.4	85.1
August	2.28	3.03	48.7	82.4
September	1.29	1.68	41.4	77.9
October	.81	1.12	29.4	69.2
November	.38	.71	19.1	57.3
December	.53	.95	13.1	48.9

Climate Stations:					
Station ID	290640	Location	Augustial 2E	From:	Period 05/01/1926 To 07/31/2000
Station ID	296812	Location	Pietown 19NE	From:	Period 09/01/1988 To 07/31/2000
Station ID	297180	Location	Quemado	From:	Period 08/01/1915 To 07/31/2000

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Station ID	296812	Location	Pietown 19NE	From:	Period 09/01/ 1988	To	07/31/ 2000
Station ID	297180	Location	Quemado	From:	Period 08/01/ 1915	To	07/31/ 2000

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from wetlands or streams.

Wetland description:

System	Subsystem	Class
NA	NA	NA

If Riverine Wetland System enter Rosgen Stream Type:

NA

REPRESENTATIVE SOIL FEATURES

Narrative:

These soils are moderately deep to deep with fine or very fine textured surfaces. Permeability is moderately slow to slow. Available water capacity is moderate to high. A thin strata of subsurface materials from gravel to clay is common. Erosion hazard is mainly in the form of gully, piping and draining of the site when vegetation has deteriorated from its natural potential. Characteristic soils are Moriarty silty clay, Navajo clay, and Manzano clay loam.

Parent Material Kind: Alluvium

Parent Material Origin: Mixed - Calcareous

Surface Texture:

1. Clay loam -- CL
2. Silty clay loam -- SiCL
3. Sandy clay loam -- SCL

Surface Texture Modifier:

1. NA

Subsurface Texture Group: NA

Surface Fragments <=3" (% Volume): Unknown

Surface Fragments >3" (% Volume): Unknown

Subsurface Fragments <=3" (% Volume): 5

Subsurface Fragments >=3" (% Volume): Unknown

	Minimum Well drained	Maximum Well drained
Drainage Class:	<u>Impermeable</u>	<u>Very slow</u>
Permeability Class:	<u>20</u>	<u>72</u>
Depth (inches):	<u>0.00</u>	<u>8.00</u>
Electrical Conductivity (mmhos/cm):	<u>0.00</u>	<u>12.00</u>
Sodium Absorption Ratio:	<u>6.6</u>	<u>8.4</u>
Soil Reaction (1:1 Water):	<u>--</u>	<u>--</u>
Soil Reaction (0.1M CaCl2):	<u>5</u>	<u>7</u>
Available Water Capacity (inches):	<u>--</u>	<u>--</u>
Calcium Carbonate Equivalent (percent):		

PLANT COMMUNITIES

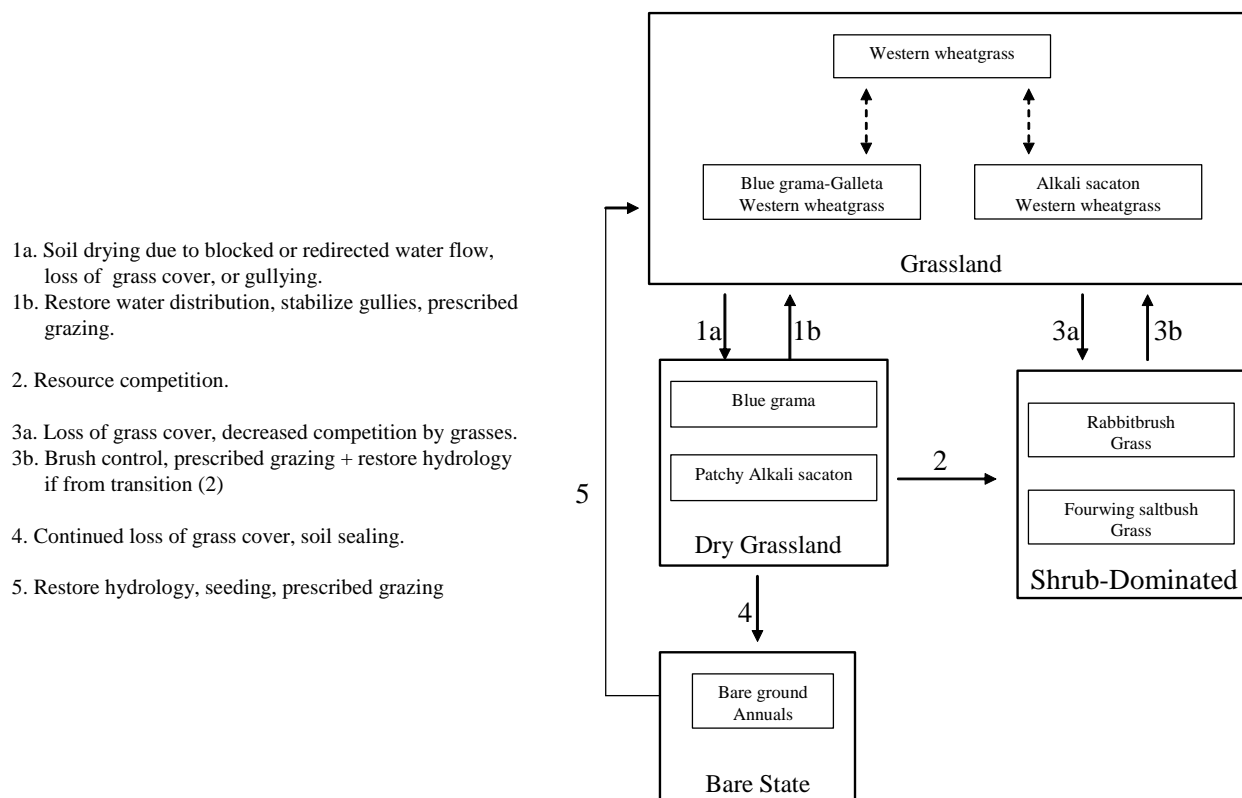
Ecological Dynamics of the Site:

Overview

This site occurs on swales, depressions, and flood plains on valley floors. It occurs as a distinct unit or as part of a mosaic with Bottomland sites. The historic plant community of the Clayey Bottomland site is a productive grassland characterized by both warm and cool-season grasses, scattered shrubs, and forbs. Western wheatgrass is the dominant grass species. Fourwing saltbush and rabbitbrush are the more common shrubs. Decreased available soil moisture due to blocked or redirected flow of run-on water, loss of grass cover, or gullying can cause a transition to a less productive Dry Grassland State. Continued loss of grass cover and soil surface sealing may result in a state with extensive areas of bare ground. Alternatively, loss of grass cover and soil drying can decrease competition by grasses, facilitating shrub encroachment and result in a Shrub-Dominated state.

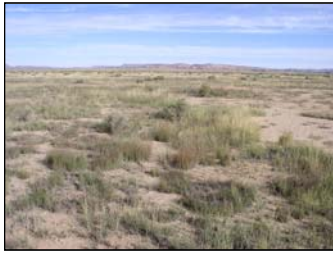
Plant Communities and Transitional Pathways (diagram)

MLRA 36, WP-2 Clayey Bottomland



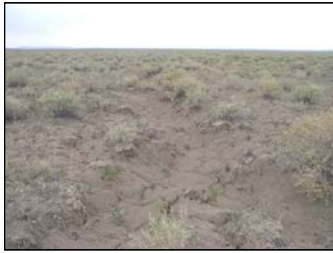
MLRA 36; WP-2; Clayey Bottomland

Grassland Transitioning to Dry-Grassland



- Alkali sacaton, blue grama, galleta, with few scattered 4-wing saltbush
- Grass cover relatively uniform to patchy with large bare areas
- Sparank clay loam, Cibola Co., NM.

Shrub-Dominated



- Fourwing saltbush, blue grama.
- Grass cover patchy, low vigor blue grama.
- Note small gully starting to form.
- Grasses and shrubs pedestalled, bare areas deflated.
- Sparank clay loam, Cibola Co., NM.

Shrub-Dominated



- Fourwing saltbush, sparse western wheatgrass.
- Grass cover sparse.
- Limited evidence of erosion.
- Venadito clay, Cibola Co., NM.

Dry-Grassland Transitioning to Bare Stare



- Very patchy alkali sacaton, galleta, blue grama with few scattered 4-wing saltbush.
- Grass cover very patchy with large bare areas.
- Bare areas sealed by physical crusts.
- Sparank clay loam, Cibola Co., NM.

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 Narrative Label: HCPC

Plant Community Narrative: State Containing the Historic Climax Plant Community
Grassland State: The historic plant community is dominated by western wheatgrass. Other important grasses that typically appear on this site include, alkali sacaton, blue grama, galleta, vine mesquite and spike muhly. Fourwing saltbush is the dominant shrub. Rabbitbrush, broom snakeweed, and winterfat may also be sparsely scattered across the site. Continuous heavy grazing will cause a decrease in western wheatgrass and vine mesquite. A community dominated by alkali sacaton or blue grama and galleta with western wheatgrass as the subdominant may result. In other instances, especially on the heavier textured clay soils, a sparse, less productive, near monotypic stand of western wheatgrass may persist.

Diagnosis: Grass cover is uniform with few large bare areas present. Shrubs are scattered with canopy cover averaging five percent. Evidence of erosion such as pedestalling of grasses, rills and gullies is infrequent.

Ground Cover (Average Percent of Surface Area).

Grasses & Forbs	50
Bare ground	18
Surface gravel	--
Surface cobble and stone	1
Litter (percent)	30
Litter (average depth in cm.)	3
Surface Gravel (% cover)	--
Canopy Cover - Shrub and half shrub	5

Plant Community Annual Production (by plant type):

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	1063	1891	2720
Forb	75	134	192
Tree/Shrub/Vine	125	223	320
Lichen	--	--	--
Moss	--	--	--
Microbiotic Crusts	--	--	--
Totals	1263	2248	3232

Plant Community Composition and Group Annual Production:

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	PASM	Western wheat	779-1001	779-1001
2	PAOB	Vine - mesquite	223-334	223-334
3	BOGR2	Blue gramma	111-223	111-223
4	PLJA MUWR	Galleta Spike muhly	223-334	334
5	SPAI	Alkali sacaton	111-223	111-223
6	ELEL5	Bottlebrush squirreltail	22-67	22-67
7	MURI MURE ARIST	Mat muhly Creeping muhly Threeawns Spp.	22-111	22-111

Plant Type - Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
8	ATCA2	Fourwing saltbush	67-223	67-223
9	KRLA2	Winterfat	22-67	22-67
10	ERNAN5 GUSA2 ARBI3	Rubber Rabbitbrush Broom snakeweed Bigelow sagebrush	22-111	22-111

Plant Type – Forb

11	2FP	Perennial forbs	22-111	22-111
12	2FA	Annual forbs	22-67	622-677

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
NA	NA	NA	NA	NA

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
NA	NA	NA	NA	NA

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
NA	NA	NA	NA	NA

Plant Growth Curves

Growth Curve ID NM0310

Growth Curve Name: HCPC

Growth Curve Description: WP-2 Clayey Bottomland HCPC Warm/Cool

Season perennial plant community

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	8	15	10	9	20	25	8	5	0	0

Additional States:

Dry Grassland: This site is characterized by decreased available soil moisture. Typically alkali sacaton or blue grama is the dominant grass species. Alkali sacaton is generally found in clumps or tussocks with interconnected bare areas between plants. Blue grama occurs as low vigor sod like patches with frequent large bare areas present.

Diagnosis: Grass cover is patchy with large interconnected bare areas present. Alkali sacaton or blue grama are the dominant grass species. Rills, gullies, or obstructions to overland flow are present.

Transition to Dry Grassland (1a): Soil drying due to blocked or redirected flow of run-on water, loss of grass cover, or gullying are thought to initiate this transition. Water retention or diversion structures, sediment deposition, or roads may block or divert water that would naturally run-on to the site. Roads or trails may concentrate water during high flow periods and facilitate gully formation. Loss of adequate grass cover due to overgrazing can decrease infiltration, increase runoff rates, and initiate gullying.

Key indicators of approach to transition:

- Reduction in western wheatgrass cover and increase in size and frequency of bare patches.
- Increase in cover of blue grama, galleta, ring muhly and mat muhly.
- The formation of trails, gullies, barriers or other features that disrupts natural overland flow

Transition back to Grassland (1b) The natural hydrology of the site must be restored. Erosion control structures, shaping or filling gullies, culverts, turnouts, or moving or re-routing obstructions may be necessary to restore natural run-on flow patterns. Prescribed grazing will help restore and maintain adequate grass cover.

Shrub-Dominated: This state is characterized by the predominance of shrubs, especially rabbitbrush, and in some instances fourwing saltbush. Blue grama, galleta, or sparse western wheatgrass are typically the dominant grass species.

Diagnosis: Rabbitbrush or fourwing saltbush is found at increased densities relative to the Grassland state. Grass cover is patchy with large bare areas present. Evidence of erosion such as pedestalling of plants, elongated water flow patterns, litter dams, and rills or gullies is common.

Transition to Shrub-Dominated (2, 3a) Loss of grass cover and resulting decreased competition by grasses are believed to initiate this transition. The loss of grass cover may be due to a change in hydrology, overgrazing, or other disturbance such as fire. Rabbitbrush is believed to increase under heavy grazing pressure⁶, and after 1-3 years following fire⁷. Fourwing saltbush is a highly palatable shrub and typically decreases in response to heavy browsing.² Resource competition by grasses is reported to negatively affect the establishment of fourwing saltbush.³ It may be possible that fourwing saltbush increases in response to a loss of grass cover and reduced competition, due to causes other than heavy grazing.

Key indicators of approach to transition:

- Change in composition or distribution of grass cover.
- Increase in size and frequency of bare patches.
- Increase in amount of shrub seedlings.

Transition back to Grassland (3b) Brush control may be necessary to initiate the transition back to the grassland state. Chemical control has been shown to be effective in controlling

rabbitbrush.^{1, 5} Root plowing and other mechanical methods that sever the plant below the root crown may reduce rabbitbrush densities, however follow up treatment may be necessary. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover. In addition the natural hydrology of the site must be restored if the transition pathway was from Dry Grassland to Shrub-Dominated (2). See Transition Back to Grassland (1b).

Bare State: Extensive areas of bare ground characterize this site. Surface soils in most bare areas are sealed over with physical crusts. Herbaceous cover consists mainly of annuals. If perennial grasses are present they occur only in isolated patches.

Diagnosis: Annuals are the dominant herbaceous vegetation. Extensive interconnected bare areas are common with scattered or no grass plants. Evidence of erosion such as rills and gullies are present.

Transition to Bare State (4a) The continued loss of remaining grass cover due to overgrazing or soil drying may cause this transition. The subsequent sealing of the soil surface by physical crusts can inhibit grass reestablishment.⁴ Additionally, heavy use by livestock during periods when the soils are saturated can cause trampling damage and soil compaction. Soil compaction decreases infiltration limiting grass reestablishment.

Transition back to Grassland (4b) The hydrology of the site must be restored first (see 1b). Seeding is necessary to reestablish Bottomland grasses. Prescribed grazing will help ensure adequate rest and proper forage utilization following grass establishment. The degree to which this site is capable of recovery depends on the restoration of hydrology, the extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

This range site provides habitats that support a resident animal community that is characterized by pronghorn antelope, coyote, black-tailed jackrabbit, Betta's pocket gopher, sparrow hawk, mourning dove, Chipping sparrow, Western spadefoot toad, leopard lizard, and prairie rattlesnake. The Chestnut-collared longspur winters on this site and the common raven and prairie falcon hunt over it.

Hydrology Functions:

This site is in hydrologic group D. Runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Hydrologic Interpretations	
Soil Series	Hydrologic Group
Moriarty	D

Recreational Uses:

This site offers limited opportunity for establishing small water areas, usually of intermittent nature, in the form of ponds or tanks. It also has potential for hiking, horseback riding, nature observation, photography, picnicking, and camping. The establishment of trails for hiking or horseback riding should be done with care, however, since frequently used trails can furnish places for natural flood waters to channel and thus begin gullying of the site. Permanent sites for picnicking and camping are best located away from this site because of flooding hazards.

Lush vegetative growth resulting from summer flooding can cause this site to contrast sharply with those surrounding it, and natural beauty is thus enhanced.

Wood Products:

This site has little or no significant value for wood products.

Other Products:

This site is suitable for grazing by most kinds and classes of livestock without regard to season of the year. It is best suited, however, to mother cows with calves old enough to take a substantial amount of milk during spring and summer months when grasses are most productive following flooding.

Excessive grazing use over a prolonged period will result in a decrease in western wheatgrass, vine-mesquite, and alkali sacaton. Blue grama may increase initially but will eventually decrease if the heavy grazing continues, and the site then becomes subject to a takeover by rabbitbrush and other invading woody plants such as sagebrush or greasewood. The site is subject to gullying or draining when the natural potential vegetation is so disturbed and may not be recoverable using improved grazing alone.

Other Information:

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index	Ac/AUM
100 - 76	2.0 - 2.9
75 - 51	2.7 - 4.3
50 - 26	4.0 - 7.5
25 - 0	7.5+

Ecological Site Description Plant Part and Species Preference Codes

Indicator Status Codes

Incomplete I

Complete C

Plant Parts	Code	Species Preference	Code
Stems	S	None Selected	N/S
Leaves	L	Preferred	P
Flowers	F	Desirable	D
Fruit/Seeds	F/S	Undesirable	U
Entire Plant	EP	Not Consumed	NC
Underground Parts	UP	Emergency	E
		Toxic	T

Plant Preference by Animal Kind:

Animal Kind: Livestock

Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Western wheatgrass	Pascopyrum Smithii	EP	D	D	P	P	P	D	D	D	D	D	D	D
Alkali sacaton	Sporobolus airoides	EP	D	D	D	D	D	P	P	P	D	D	D	D
Vine-mesquite	Panicum obtusum	EP	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Blue gramma	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Spike muhly	Muhlenbergia Wrightii	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Giant sacaton	Sporobolus Wrightii	EP	D	D	D	D	D	P	P	P	D	D	D	D
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	D	D	D	U	U	U	D	D	D	U
Winterfat	Krascheninnikovia lanata	EP	D	D	P	P	P	P	P	P	D	D	D	D
Fourwing saltbush	Atriplex canescens	EP	P	P	P	P	P	D	D	D	D	D	D	P

Plant Preference by Animal Kind:

Animal Kind: Livestock

Animal Type: Sheep

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Galleta	Pleuraphis jamesii	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Most perennial forbs	Various	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Vine-mesquite	Panicum obtusum	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Blue gramma	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Spike muhly	Muhlenbergia Wrightii	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	D	D	D	U	U	U	U	U	U	U
Winterfat	Krascheninnikovia lanata	EP	P	P	P	P	P	P	P	P	P	P	P	P
Fourwing saltbush	Atriplex canescens	EP	P	P	P	P	P	D	D	D	D	D	D	P

Plant Preference by Animal Kind:

Animal Kind: Livestock

Animal Type: Horses

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Western wheatgrass	Pascopyrum Smithii	EP	D	D	P	P	P	D	D	D	D	D	D	D
Alkali sacaton	Sporobolus airoides	EP	D	D	D	D	D	P	P	P	D	D	D	D
Vine-mesquite	Panicum obtusum	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Blue gramma	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Spike muhly	Muhlenbergia Wrightii	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Giant sacaton	Sporobolus Wrightii	EP	D	D	D	D	D	P	P	P	D	D	D	D
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	D	D	D	U	U	U	D	D	D	U

Plant Preference by Animal Kind:

Animal Kind: Wildlife

Animal Type: Pronghorn

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Most perennial forbs	Various	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	P	P	P	U	U	U	D	D	D	U
Winterfat	Krascheninnikovia lanata	EP	D	D	D	D	D	D	D	D	D	D	D	D
Fourwing saltbush	Atriplex canescens	EP	D	D	D	D	D	D	D	D	D	D	D	D

Supporting Information

Associated Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
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Similiar Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
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State Correlation:

This site has been correlated with the following states:

Inventory Data References:

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
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Type Locality:

Relationship to Other Established Classifications:

Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus & Mesas Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Catron, Cibola, Socorro and Sandoval.

1. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (*Sarcobatus vermiculatus*) and salt rabbitbrush (*Chrysothamnus nauseosus* ssp. *consimilis*). *Weed Science*. 31: 275-279.
2. Pieper, R. D. and G. B. Donart. 1978. Response of fourwing saltbush to periods of protection. *Journal of Range Management*. 31: 314-315
3. Ueckert, D. N, and J. L. Pertersen. 1991. Selecting *Atriplex canescens* for greater tolerance to Competition. *Journal of Range Management*. 41: 220-222
4. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 7 [Online]. Available: <http://www.statlab.iastate.edu/survey/SQI/range.html>
5. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. *Journal of*

Range Management. 41: 470-472

6. Whitson, T.D. (ed.). 1999. Weeds of the West. The Western Society of Weed Science, Wyoming. pp 103
7. Wright, H. A. 1972. Shrub response to fire. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: [http://www.fs.fed.us/database/feis/\[2004\]](http://www.fs.fed.us/database/feis/[2004]).

Characteristic Soils Are:	
Moriarty silty clay	
Other Soils included are:	
Navajo clay	Manzano clay loam

Site Description Approval:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Don Sylvester	2/15/80	Durwood E Ball	3/27/80

Site Description Revision:

	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Brenda Simpson	8/20/02	George Chavez	03/03/05
David Trujillo	12/16/04		